

MARITIME HERITAGE MINNESOTA



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Minnesota Dugout Canoe Project 2 Report



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Acknowledgments

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Cover: Wah-ba-sha Village on the Mississippi River. Some of the canoes depicted here are probably dugout canoes. Pencil sketch by Seth Eastman, 1847 (Hennepin County Library, Eastman Sketchbook).



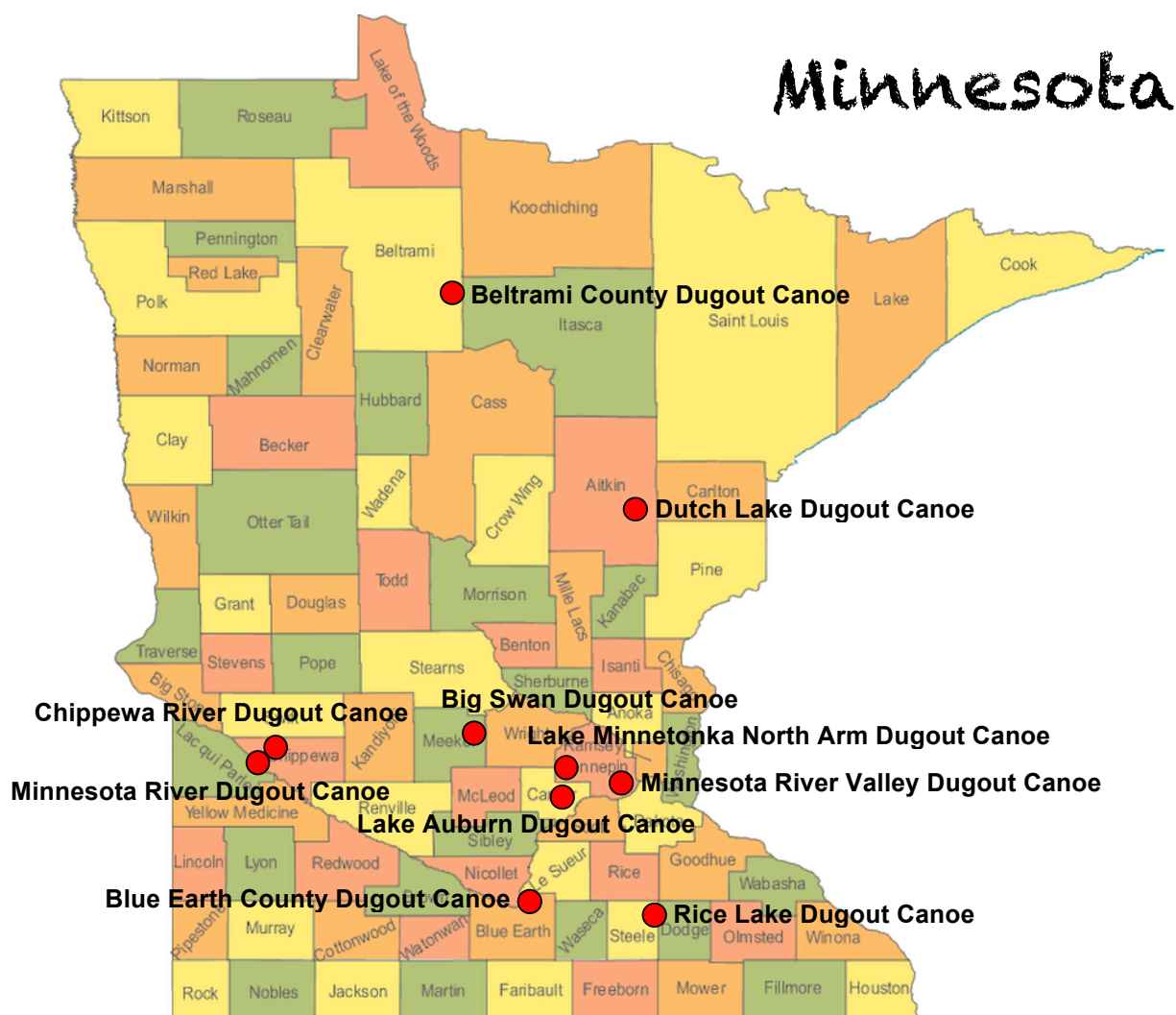
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Introduction

Maritime Heritage Minnesota (MHM) conducted the Minnesota Dugout Canoe Project (MDC) in 2013 and 2014. That project reported on eight dugout canoes documented and sampled by MHM. During that project, two additional dugout canoes came to MHM's attention, but funds to document and collect samples for radiocarbon tests were not available. Once funds were secured in late 2014, MHM documented the Beltrami County Dugout Canoe (BCDC) and Blue Earth County Dugout Canoe (BECDC) and took small wood samples. The samples were tested using Accelerated Mass Spectrometry in late 2014. The results of these tests and where these two dugout canoes fit within the greater body of Minnesota's oldest known watercraft are presented here.



The geographic locations of dugout canoes that have been documented and studied by MHM.

Research Design and Methodology

The Minnesota Dugout Canoe Project 2 (MDC-2) was designed utilizing successful techniques used during the MDC Project. MHM received permission to take small wood

samples from the canoes for dating purposes. MHM measured, drew, and photographed both canoes and conducted condition assessments of each artifact, collected accession data, and conducted research in order to place the watercraft into their historical contexts. The wood samples for radiocarbon dating were sent to the Beta Analytic lab in Florida for analysis. For more information on the use of Native American dugout canoes in Minnesota, other known archaeological examples around the United States, and the analysis of the eight canoes MHM documented during the MDC Project, see the *Minnesota Dugout Canoe Project Report*. However, an overview of the eight canoes is helpful to place the BECDC and the BCDC into their contexts.

Minnesota Dugout Canoes

With no supporting artifacts associated with any of the dugout canoes studied during the MDC and MDC-2 Projects, MHM has depended on historical sources for context. Descriptions of dugout canoes constructed and used by Native Americans and Europeans exist from 1835 to the early 1850s in travel diaries and watercolor paintings and pencil sketches by artist Captain Seth Eastman. One account has survived from Count Francesco Arese, who traveled Minnesota's waterways in 1837. At Traverse des Sioux on the Minnesota River, known to Arese as the St. Pierre River, he traded his horse to two Native Americans for what he described as a "small boat". However, this small boat is also characterized as a "canoe", but it probably was not a dugout canoe because Arese provided a detailed account of the next watercraft he used in Minnesota. He took to the Mississippi River at the confluence with the Minnesota River in a dugout with two Canadians. Arese described their craft as "a wooden one made of a tree trunk. It was 30 or 35 feet long and from 1/2 to 2 broad. When I was sitting on the bottom of it...I had a hard time moving, for the great trouble with such canoes is that they are very unsteady and a fairly heavy wave fills them at once. A person not accustomed to them hardly dares to move; but in a short while you learn to turn in every direction without making them lose their balance" (Arese 1934, 118, 129).



Seth Eastman's pencil drawing of Dakota people using canoes near Shakopee in 1848 (Bushnell 1832).

Radiocarbon Dating of Dugout Canoes

During the documentation of the dugouts studied for the MDC-2 Project, MHM used a small drill bit to create a hole 1/4 inch deep into the hull of each canoe and then used a smaller drill bit to deepen the hole into the wood. This way, the small bit would produce wood shavings clear of contaminants. Each sample collected was less than 100 mg in size and underwent Accelerated Mass Spectrometry radiocarbon dating tests at Beta Analytic Radiocarbon Dating Laboratory of Miami, FL. The results were presented to MHM on data sheets that listed the canoe's 'Conventional Radiocarbon Age' (CRA) in the form of a 'number of years \pm a number of years BP' (Before Present) or 'number of years \pm a number of years pMC' (percent Modern Carbon). In this context, 'Present' is the year 1950. Also provided were a range of '2 Sigma calibrated results' in the form of ranges of calendar dates that indicate the probability that a date range is the correct age of the sample. The 2 Sigma results provided by the lab used the 2013 calibration database to calculate the calendar date range probabilities of 95%. MHM re-calibrated the CRA data using the 2013 calibration database provided online by Oxford University (OxCal) to a 99.7% probability. The calibrated calendar dates provided below represent the date range that have the highest probability of being correct within the technology available.



An artist's watercolor rendering of dugout canoe construction (Klammerer 1934-1935, 88).

Blue Earth County and Beltrami County Dugout Canoes

Blue Earth County Dugout Canoe

Blue Earth County Historical Society 659.1, Mankato

MHM documented the Blue Earth County Dugout Canoe (BECDC) housed at the Blue Earth County Historical Society (BECHS) in Mankato on December 4, 2014. The canoe is double-ended, is 10.37 feet long, 1.96 feet in the beam, and has a 1.07-foot depth of hold. The vessel is complete, with intact gunwales, although there are cracks near both ends. The pointed ends are upturned and the tops are flattened. The hull is finely carved with tool marks evident throughout. At various places on the canoe, a resin or similar liquid had been applied to the hull inside and out. MHM took a small wood sample from the bottom of the hull and it was radiocarbon tested using Accelerated Mass Spectrometry. The BECDC has a 2 Sigma calibrated calendar age of AD 1665-1786 (140 ± 30 BP), placing it in the Early Historic Period/Early Contact Period. Since there are no other artifacts associated with the BECDC, it cannot be determined if the canoe is a product of the late Mississippian Culture or the Dakota Culture (Gibbon 2003, 2-3, 56). However, the similarities between the BECDC and a painting of a Dakota dugout canoe by Seth Eastman from the mid-19th Century is clear.



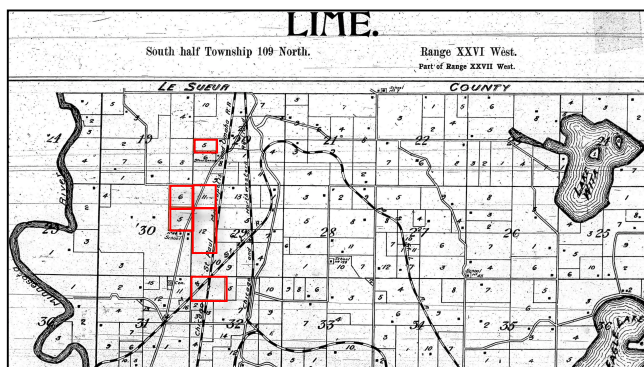
The Blue Earth County Dugout Canoe on exhibit at the Blue Earth County Historical Society. Compare the basic shape of the BECDC to the Dakota canoe below. Note the double-ended nature of both canoes with the flattened tops. The glass boxes at either end of the photo are two artifact vitrines that are next to the canoe (MHM).



A Seth Eastman depiction of a mid-19th Century Minnesota dugout canoe made and used by the Dakota (Schoolcraft 1852, Pl. 72.5, digitized by MHM).

Morgan Brooks of Lime Township in Blue Earth County found the BECDC in the late 1890s. The Blue Earth County Historical Society's (BECHS) accession information for the canoe indicates it was officially accepted into their collection in March 1969 (BECDC Accession File). The context of the canoe is unknown, but Brooks and one of his relatives owned several plots of land in the township. However, none of these plots had

a creek or river running through it, nor did they have a lake on them. However, a section of the Minnesota River, Lake Wita, and Eagle Lake are located in Lime Township.



A plat map of Lime Township in 1895. The red boxes outline the parcels of land owned by Morgan Brooks and D. R. Brooks. The nearest water sources where the BECDC may have been found are the Minnesota River, Lake Wita, and Eagle Lake (Central Publishing Company 1895, 38-39).

Due to evidence documented by MHM, it is apparent that Brooks planned to or did use the canoe after he recovered it. The canoe's inner hull has a large piece of metal incorporated into its bottom that was used to repair damaged wood. Two flat metal pieces were attached to the outer bottom of the hull with short cut nails to patch a large hole. Metal straps are attached to the outside of the hull around one canoe's end to reinforce it, with the two straps overlapping each other. The straps would have been around the waterline if the canoe was occupied. These additions are not needed if the canoe was going to inhabit a simple static exhibit and they have been incorporated into the artifact for many decades. Finally, someone etched the initials "W M" into the dugout canoe's gunwale; it cannot be determined when this act of vandalism occurred. The canoe is in stable condition.

All the photos of the BECDC were taken by MHM.



Right: One of the pointed and flattened ends of the BECDC with tool marks along the gunwale.



Left: The two pointed ends and good condition of the BECDC are evident. Note the black resin stains and the metal plate amidships.



Right: Two metal straps attached to the end of the canoe with short wire nails.



Two metal plates on the bottom of the BECDC along with resin.

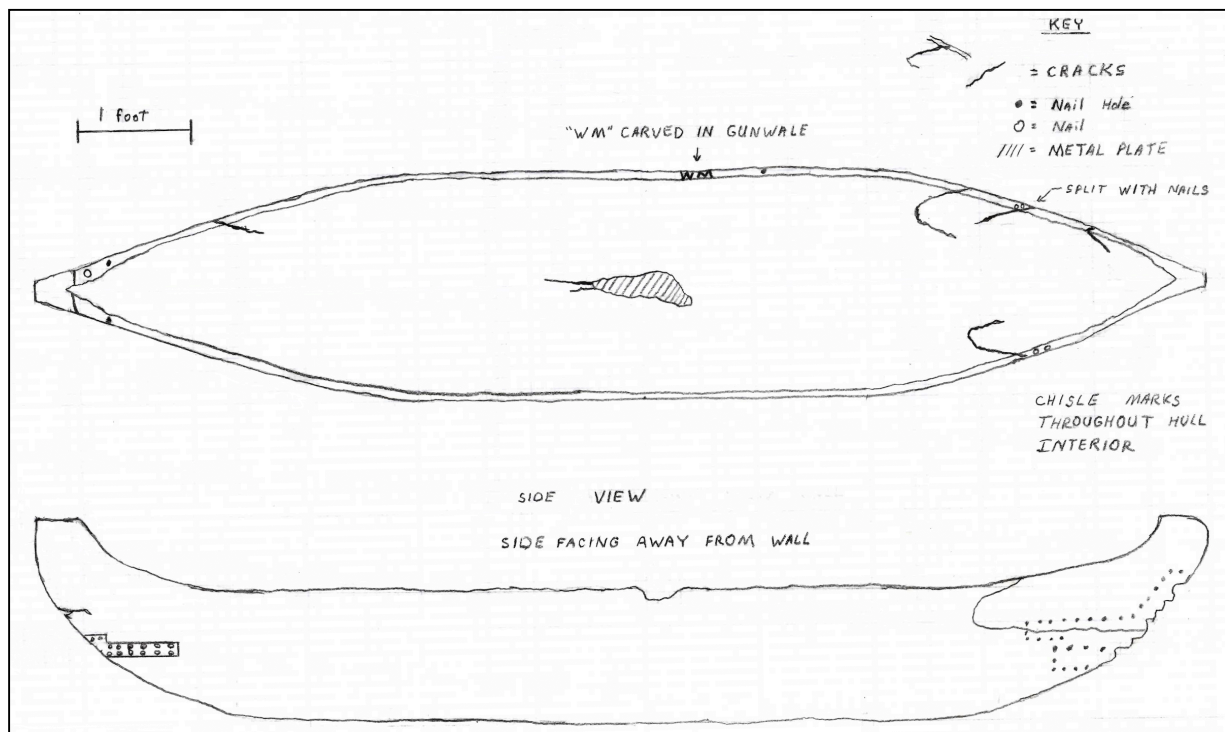
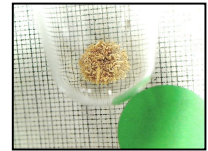


The metal plate attached to the bottom of the outer hull is sealing this large hole in the BECDC. The exposed metal is indicated by the red arrow.



Left: The initials "W M" carved into the gunwale of the BECDC.

Right: The wood sample taken by MHM that was radiocarbon tested using Accelerated Mass Spectrometry (Beta Analytic 2014).



A drawing of the BECDC (Christopher Olson).

Beltrami County Dugout Canoe Beltrami County Historical Society, Bemidji

MHM documented the Beltrami County Dugout Canoe (BCDC) at the Beltrami County Historical Society (BCHS) in Bemidji on September 20, 2014 as part of a Minnesota

Archaeology Week event. An audience was invited to observe the documentation process and MHM answered questions about dugout canoes in general and the methods used to record and date the BCDC. MHM measured, photographed, and drew the BCDC, and took a small wood sample for radiocarbon testing. The BCDC is 10.9 feet long, 1.75 feet in the beam, and has a .72-foot depth of hold. It has pointed ends that are rounded as they lead to the vessel's bottom, and are thick and heavily carved. There are remnants of nine curved lines of sharp chisel marks throughout the inner hull at various intervals. These athwartships cuts were probably made so the wood between the chiseled lines could be split longitudinally and removed during the construction process. This process for dugout canoe construction was used in the Contact and Post Contact Periods after the introduction of metal tools into Minnesota's (Eastman 1914, 50-51). It appears that the maker was going to hollow-out the tree trunk further, but stopped for some reason. There are wire nails imbedded into the gunwales at various spots whose function is unknown. Both ends have evidence of woodpecker damage as typified by deep elongated holes bored into the wood. The canoe has a mark on its outer hull that resembles a sideways "A 83"; the meaning of this mark is unknown. The BCDC resembles the Minnesota River Dugout Canoe (see below) found in Chippewa County.

All the photos of the BCDC were taken by MHM.

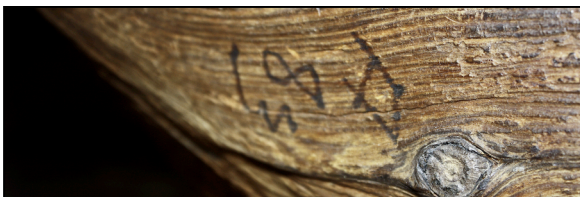


Above: Chisel marks on the inner hull of the BCDC.

Left: The Beltrami County Dugout Canoe on exhibit at the Beltrami County Historical Society.



The heavy construction of the BCDC is seen here along with the hull marking.

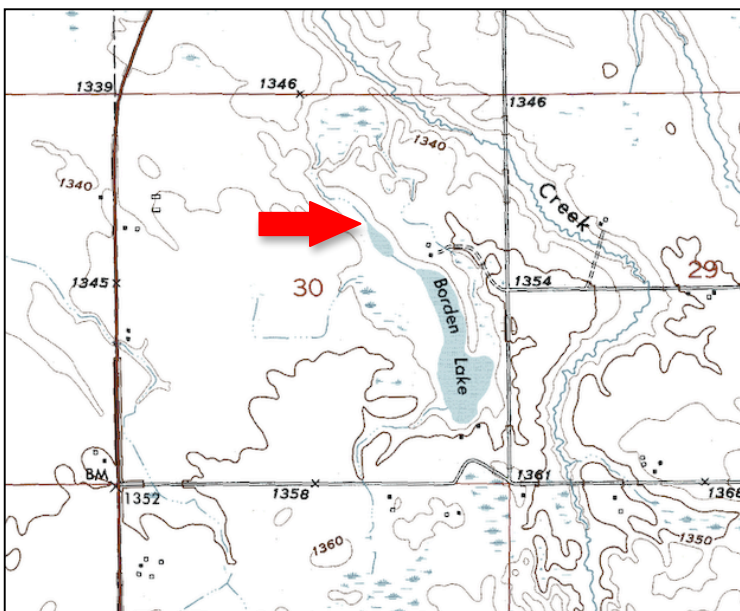


The sideways "A 83".

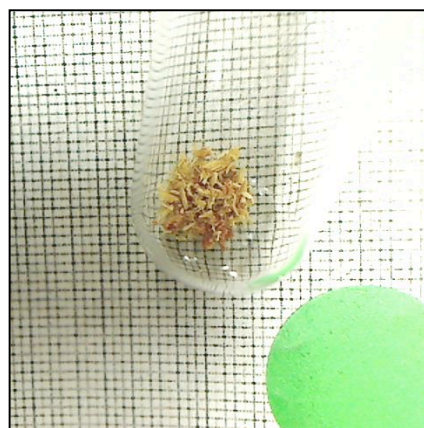
One end of the BCDC. Both ends have deep round holes bored into them that clearly suggest it was fed upon by woodpeckers.



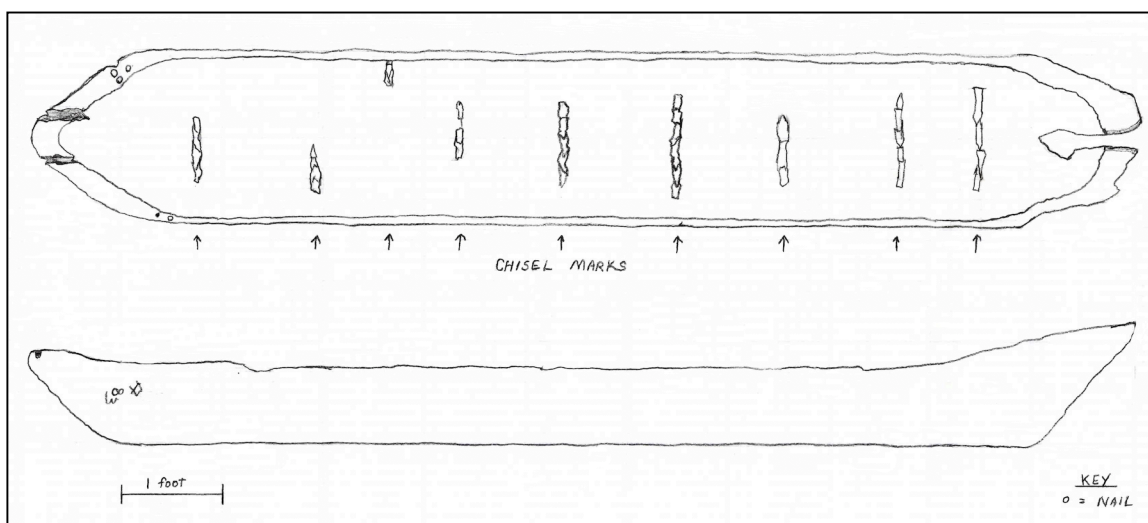
The BCDC was found in a creek that ran out of the northwest end of Borden Lake in Hornet Township in Beltrami County. According to the story behind the discovery, Borden Lake was locally known as Anderson Lake and at one point Thullen's Lake. The canoe was simply thought to be a log until 1964, when Jean and Terrance (Terry) Costello were at the creek spearing fish. They investigated the 'log' and determined that it was a canoe. According to Terry, the "'log' had been visible for as long as I can remember" at that location; he was in college in 1964. The BCDC was left *in situ* at that time but a neighbor of the Costellos dragged the dugout canoe to their back yard later. The canoe was delivered to the BCHS by 1967 when Terry was traveling through Bemidji and stopped to see it on exhibit. Some information claims the canoe was found and accessioned into the BCHS collection in 1962 (BCDC Accession File).



The location of Borden Lake in Hornet Township in Beltrami County. The red arrow indicates the area where the BCDC was found (USGS 1972).



Above: The wood sample taken by MHM that was radiocarbon tested using Accelerated Mass Spectrometry (Beta Analytic 2014).



A drawing of the BEDC. Note the chisel marks along the bottom of the inner hull (Christopher Olson).

An informational card associated with the BCDC claims that "while the origin [of the canoe] is unknown, Arnold and Chris Peterson remember using it for hunting and fishing in the 1890's" (BCDC Accession File). During the documentation of the BCDC, this information served as evidence that the canoe was constructed in the late 19th Century, at least. However, the radiocarbon testing results indicates that the tree the BCDC was carved from was still living in the early or mid-1950s. Instead of a calendar date, the lab report states that the BCDC shows this result: 110.9 ± 0.1 pMC. The lab explained: "The reported result indicates an age of post 0 BP and has been reported as a % of the modern reference standard, indicating the material was living about the last 60 years or so ("pMC" = percent modern carbon)", where the year 0 BP is 1950. The lab explained further: "The source of this "extra" ^{14}C in the atmosphere is thermo-nuclear bomb testing which on-set in the 1950s. Its presence generally indicates the material analyzed was part of a system that was respiring carbon after the on-set of the testing (AD 1950s)" (Hood 2014).

The modern date of the BCDC does not negate Terry and Jean Costello's story, since Terry's remembrance of seeing the 'log' in the creek for as long as he could remember suggests his memory extended into the early 1950s. However, the story of Arnold and Chris Peterson must be addressed. They claimed to have used the dugout canoe in the 1890s and from the radiocarbon dating results, this cannot be true. However, there may be validity to their story if they used a different canoe. There may be some confusion, on the part of the Petersons, as to where they used the canoe they found. Borden Lake was known locally as Anderson Lake according to Terry Costello. However, Beltrami County does have an Anderson Lake located in Blackduck State Park. It is possible the Petersons found a dugout canoe there and used it in the 1890s. If this is true, there is another, older dugout canoe in Beltrami County yet to be discovered - if it has survived.

Dugout Canoes from the MDC Project

Presented next are brief histories, descriptions, and the radiocarbon dating results of the eight dugout canoes documented during the MDC Project. They are ordered chronologically from oldest to youngest.

Lake Minnetonka North Arm Dugout Canoe (21-HE-438)
Western Hennepin County Pioneers Association, Long Lake

During low water conditions due to a severe drought on late August 1934 Helmer Gunnarson and his brother Arthur, sons of Gustave A. Gunnarson, discovered the Lake Minnetonka North Arm Dugout Canoe (LMNADC) in Orono, Hennepin County. Throughout the summer, the Gunnarson family had to construct extensions to their dock as the water continually receded from the normal shoreline. At that time the lake level was just over seven feet below its ordinary high water level. Helmer and Arthur had sunk several dock pilings but one hit an obstruction 10-12 inches below the silt. Thinking they had hit a log, they exposed the object and dragged it onto the shoreline where they determined it was a dugout canoe. Helmer and Arthur observed that the canoe "had been maintained in an excellent state of preservation as a result of having been imbedded in earth and completely covered by several feet of water over an extended period of time". The Western Hennepin County Pioneer Association (WHCPA) acquired the LMNADC in 1961 (Gunnarson and Gunnarson 1966). In its current condition the artifact is 11.1 feet long, 1.4 feet wide, and its depth of hold is .55 feet deep. The artifact's sides have deteriorated and the original height of the vessel to its gunwales is unknown. The wood sample has a calendar age of AD 1025-1165 (930±30 BP), indicating the artifact was made during the Woodland Period (Gibbon 2012, 145; Merriman and Olson 2014, 9-12).



The Lake Minnetonka West Arm Dugout Canoe (MHM).

Big Swan Dugout Canoe (21-ME-37)
McLeod County Historical Society 88.2266, Hutchinson

Minnesota Department of Conservation, Fish and Game Division workers snagged the Big Swan Dugout Canoe (BSDC) while seining for carp in Big Swan Lake in Meeker County sometime between mid-December 1957 to mid-January 1958. The artifact was transferred to the McCleod County Historical Society (MCHS) where it has been housed since January 1958 (*Hutchinson Leader* 1958; *The Independent Review* 1958). In 2012 the MCHS had a radiocarbon test conducted on a sample of BSDC's wood and it has a

calendar age of AD 1039-1210 (900±30 BP). The artifact is 14.25 feet long, 1.95 feet wide, has a .6-foot depth of hold amidships, and the canoe's sides are mostly deteriorated. The outer hull of the BSDC is rough, with numerous knots from the source tree still visible. This attribute may indicate that the canoe was hastily constructed since the builder did not spend time to fashion a sleek hull that would move more efficiently through the water; the builder might have been short on time and needed a watercraft quickly. The artifact was made during the Woodland Period (Gibbon 2012, 145; BSDC Accession File; Merriman and Olson 2014, 12-14).



The Big Swan Dugout Canoe (MHM).

Chippewa River Dugout Canoe **Chippewa County Historical Society 85.3.1, Montevideo**

The Chippewa River Dugout Canoe (CRDC) was discovered in 1867 or 1868 by Ole Torgerson in the section of the Chippewa River that ran through his farm in west central Chippewa County. Recent information from two of Mr. Torgerson's grandsons confirmed that Mr. Torgerson found the canoe on the riverbank covered in fresh brush, indicating that it had been recently used. The calendar date of the CRDC's construction is AD 1436-1522 (400±30 BP), indicating it is from the Late Woodland Period. Apparently someone in the late 1860s used the canoe when it could have been over 430 years old. The CRDC was stored in different sheds over the years until it was purchased by the Chippewa County Historical Society (CCHS) in 1985 (CRDC Accession File; Bob Breven and Dean Thompson, perssona communication, 31 March 2015). The CRDC is 12.2 feet long, 1.74 feet wide, has a .96 foot depth of hold, has a 'handle' inserted through one end, and a thwart was nailed onto the the other end to serve as a handle. The artifact displays numerous tool marks throughout the inner hull, left behind by the stone implements used to carve out the tree. MHM contends that even though the craft is a canoe, it has a bow and stern, with one end pointed and the other rounded. The CRDC is stable and in excellent condition and considering its post-river recovery existence stored in uncontrolled environments. The 'stern thwart' (affixed to the artifact with wire nails from the 20th Century) and the 'bow handle' were attached to the CRDC by Mr. Torgerson or his relatives (Merriman and Olson 2014, 14-16).



Left: The CRDC's bow with a 'handle' inserted into a hole bored through the hull (MHM).
Below: The stern 'thwart' or carrying handle (MHM).



Minnesota River Dugout Canoe (21-CP-72)
Chippewa County Historical Society 1998-0483, Montevideo

In February 1982 Minnesota River canoe paddlers Doug Pederson and Wendell Peterson noticed the pointed end of a dugout canoe protruding from the shallow water in the river channel. This section of the river was not frozen, even in February, probably due to its position south of the Churchill Dam. In mid-July 1982, Pederson and Peterson returned to the site and with the help of Lon Redel and Brad Rasmussen, removed the Minnesota River Dugout Canoe (MRDC) from the sandy bottom. They tied the artifact with ropes in order to keep its shape and transferred it to Pederson's garage. At that time they contacted the Minnesota Historical Society (MNHS) and on the advice of the society's personnel, kept the artifact wet (*American-News* 1982). Questions of MRDC's ownership rightly were raised when authorities from the MNHS and the OSA studied the artifact in August 1982. In the end, the OSA allowed the CCHS's Pioneer Village to accession the MRDC into its collection while the OSA and MNHS archaeologists oversaw conservation treatment of the artifact (MRDC Accession File; Wanke 1982). The MRDC is 14.75 feet long, 1.75 feet wide, amidships it has an 11.5-inch depth of hold, and a small wood sample was taken. The MRDC has two distinct pointed ends, indicating that either end could serve as the bow or stern, although one end is a bit wider, suggesting a stern. The MRDC has a calendar age of AD 1626-1679 (250±30 BP), placing it in the Protohistoric to Early Historic Periods, spanning what is considered the pre-contact and early post-European contact era. It is probable that the MRDC is of the late Mississippian Culture (Johnson 1988, 25; Merriman and Olson 2014, 17-20).



Marks created by stone tools are clearly evident in the inner hull of the MRDC (MHM).

Left: This end of the MRDC is cracked but not broken apart. The craft's point is still intact (MHM).

C. Maki Dugout Canoe (21-AK-bs), Cokato Museum 76.4, Cokato

The C. Maki Dugout Canoe (C.MDC) was found by fisherman Chester Maki in 1973 in Aitkin County's Dutch Lake and donated it to the Cokato Museum in 1976 (C.MDC Accession File). The artifact is 13.65 feet long, 1.56 feet wide, has a .58-inch depth of hold amidships, and the canoe's sides are mostly deteriorated. The C.MDC has a calendar age of AD 1770-1830 (150 ± 30 BP). This date range and the artifact's location in Aitkin County indicates the canoe was made by people of the Ojibwe culture during the Contact Period (Blegen 1963, 21-23; Merriman and Olson 2014, 20-21).



The C. Maki Dugout Canoe (MHM).

Minnesota River Valley Dugout Canoe **Bloomington Historical Society 64-1, Bloomington**

Bloomington farmer George Hopkins found the Minnesota River Valley Dugout Canoe (MRVDC) between 1966 and 1968. Reportedly the artifact was "sticking out horizontally from the river bank a few feet from the bluff" in the Minnesota River Valley, indicating the water channel was either at a low phase or had shifted. The MRVDC was taken to the Bloomington Historical Society (BHS) and conserved (MRVDC 64-1 Accession File). The MRVDC is 12.55 feet long, is 2.45 feet wide, and has a .59-foot depth of hold. Both ends and the sides of the canoe are deteriorated so its bow and stern configurations cannot be determined. The artifact has a calendar age of AD 1790-1850 (130±30 BP). Based on the artifact's original location in the Minnesota River Valley in Bloomington and its date range of creation, the MRVDC was made and used by the Dakota people during the European Contact Period with a brief over-lap in the post-Contact Period (Gibbon 2003, 2-3, 56; Merriman and Olson 2014, 21-22).



The Minnesota River Valley Dugout Canoe (MHM).

Rice Lake Dugout Canoe **Dodge County Historical Society 90.23.1, Mantorville**

The Rice Lake Dugout Canoe (RLDC) reportedly was found in Rice Lake in the easternmost portion of Dodge County or the westernmost portion of Steele County. It is unknown who found the RLDC (RLDC Accession File). The RLDC is 12.67 feet long, has a 1.6 foot beam, and since its sides are missing, it has no depth of hold but the bottom thickness is .29 inches. Regardless of the fragmentary nature of the artifact, there is enough material to conclude that both ends of the canoe were pointed and had a hard chine. There are large tool marks evident throughout the inside bottom of the hull that are not smoothed out. The RLDC has a calendar age of AD 1790-1850 (130±30 BP) and was made and used by the Dakota people during the European Contact Period with an over-lap in the post-Contact Period (Gibbon 2003, 2-3, 56; Johnson 1988, 25; Merriman and Olson 2014, 23-24).



The Rice Lake Dugout Canoe (MHM).



One end of the RLDC can be investigated from both sides. The pointed nature of the dugout is apparent along with evidence of scuffs and tool marks (MHM).

Lake Auburn Dugout Canoe Minnesota Historical Society #9827, St. Paul

The accounts surrounding the discovery of the Lake Auburn Dugout Canoe (LADC) vary depending on the recollections of the people involved. Contemporary reports initially claimed the LADC was discovered on 21 May 1933 but it was revealed that the canoe was spotted in the autumn of 1932. Regardless of the actual story surrounding the removal of the LADC from Lake Auburn, it was offered to Henry Ford for his newly-developed museum in Dearborn, MI for \$500. Henry Ford did not purchase the LADC but it was exhibited at the 1934 Sportsman's Show as a "prime attraction", at the Walker Art Gallery, and Dayton's department store. In July 1960, the LADC was to the MNHS (Klammerer 1934-1935, 88-89; LADC Accession File; *Minnetonka Record* 1933; *St. Paul Dispatch* 1960; *Weekly Valley Herald* 1933a, 1933b). The LADC is 16 feet long, 26 inches wide, with a 16 inch depth of hold and has a calendar age of AD 1920-1933 (0 ± 30 BP), obviously indicating that the dugout canoe was fashioned by a person from the Lake Auburn area near the time it was found. The canoe classifies as a forgery and at best, a replica; the intent of its maker was to deceive anyone who found the craft into perceiving it to be artifactual and constructed by Native Americans. However, considering its age, it is now an antique and is a European American's 20th Century interpretation of the appearance of a Native American dugout canoe (Merriman and Olson 2014, 24-28).



The LADC after it was removed from Lake Auburn (MNHS HE5.19p18, digitized by MHM).



The LADC in storage at the MNHS (MHM).

Conclusions

At this point, the BECDC and the BCDC must be placed into the context of the other eight known dugout canoes in Minnesota. The 10 known Minnesota dugout canoes come from five cultures, spans nearly 1,000 years, and covers six geographic areas. The two oldest canoes, the LMNADC and BSDC, have carved ends that are bluff (rounded) with a soft chine. Further, the 1934 photograph of the LMNADC indicates that it probably had a definite bow and stern that are suggestive of the next oldest canoe, the CRDC. The current condition of the LMNADC does not reflect this similarity, but it appears that one end of the inner hull was wider and more bluff, like the CRDC. The CRDC's ends exhibit what could be called partially-hard chines – not hard (sharp) but not rounded – a kind of intermediate form. The design of this canoe clearly suggests a bluff and wider stern coupled with a defined pointed bow. Moving on to the next oldest dugout, the MRDC, both its pointed ends are similar to the bow of the CRDC, although the ends are carved more thinly resulting in a lighter canoe. However, the MRDC does not exhibit a hard chine at either end, and this attribute is suggestive of the construction of the LMNADC and the BSDC. The bow design of the CRDC – pointed with a defined somewhat hard chine – would allow the watercraft to move more swiftly through water since there was less drag from the submerged section of the bow. The fact that this trait was not incorporated into the MRDC is interesting, with one explanation being that its maker was less-skilled than the CRDC's maker.

The BECDC is the fifth oldest known watercraft in Minnesota, placing it after the LMNADC, BSDC, CRDC, and MRDC chronologically. The MRDC dates to the Mississippian Culture and the BECDC may be from the end of that period, or it may be Dakota. The painting of the Dakota canoe by Seth Eastman strongly resembles the BECDC and there is a good argument for the dating of the canoe to the Early Contact Period. After the BECDC in the chronological order come the C.MDC and the MRVDC. Unfortunately, the ends of the C.MDC and the MRVDC have not survived and cannot be analyzed. The RLDC clearly incorporates hard chines on both ends and while either end could be used as the bow or stern, one end is a bit broader, suggesting the stern. The RLDC would have moved swiftly through the water with less drag than the other examples. MHM contends the LADC classifies as a forgery or at best, a replica. The intent of its maker was to deceive anyone who found the craft into perceiving it to be artifactual and constructed by Native Americans. However, considering its age, it is now an antique and is a European American's 20th Century interpretation of the appearance of a Native American dugout canoe. Lastly, while the BCDC dates to what is considered the 'modern era' like the LADC, its study and documentation produced valuable information about dugout canoe construction in the form of the chisel marks. Further, the age of the BCDC and the intention of the canoe maker distinguishes it as an artifact, not a forgery or replica, unlike the LADC. The BCDC was undoubtedly created by European Americans using a Contact or Post Contact Period technique - described by Charles Eastman in 1914.

MHM is eager to document more dugout canoes and place them temporally, stylistically, and geographically into the system established through the comparison of the examples discussed here. The ability to determine the probable age ranges for the dugout canoes documented during this study enabled MHM to begin a database of these artifacts and their characteristics. The age of the artifacts, the attributes they exhibit, the geographic locations where they were discovered, and their condition further our knowledge about the people who constructed and used this earliest form of Minnesota waterborne transportation. The age ranges of the dugout canoes, AD 1025-1950s, encompass nearly the last 1,000 years of Minnesota's maritime history. Tool marks on both prehistoric and historic canoes are tangible remnants of the actual production process, and their geographic locations indicate the cultural background of their creators depending on their age. The information accumulated during this project builds upon itself and the attributes recorded from each dugout canoe provides starting points for future artifact studies.

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